

REMARKS/ARGUMENTS

This Amendment is in response to the Office Action mailed July 2, 2009.

In the Office Action, the Examiner rejected claims 19, 20, and 22-27 under 35 U.S.C. § 101 and claims 1, 2, 4-11, 13-20, 22-29, and 31-36 under 35 U.S.C. § 102.

Applicant has amended independent claims 1, 10, 19, and 28 to further clarify embodiments of the invention.

Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Rejection Under 35 U.S.C. § 101

Claims 19, 20, and 22-27 stand rejected under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory subject matter.

As requested by the Examiner on page 5 of the Office Action, Applicant has amended the specification to address the Examiner's concerns.

Applicant respectfully requests that the Examiner withdraw the rejection of claims 19, 20, and 22-27 under 35 U.S.C. § 101.

Rejection Under 35 U.S.C. § 102

Claims 1, 2, 4-11, 13-20, 22-29, and 31-36 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 6,496,847 to Bugnion et al. (hereinafter Bugnion).

On pages 5-6 of the Office Action, the Examiner stated that: "...it is uncertain from the claim how the original and target protected mode environments are related to the VM, the Examiner has mapped the original targeted protected mode to be the at least one protected mode environment operating in the virtual machine, while the target protected mode environment is mapped to the host...i.e....Do both the original and target environment run on the VM? The

Applicant should have stated that both the original and target protected environment are both running on the VM, which in turn runs on the VMM to overcome this interpretation...”

In order to clarify embodiments of the invention, Applicant has amended independent claims 1, 10, 19 and 28 to address the Examiner’s desire for a clearer interpretation of the claims.

Applicant respectfully submits that amended independent claims 1, 10, 19, and 28 are not anticipated by Bugnion because Bugnion does not describe or suggest the elements set forth in Applicant’s amended independent claims.

In particular, looking at amended independent claim 1, amended independent claim 1 recites: a processor having a normal execution mode and a host execution mode...a virtual machine monitor (VMM) *implemented in the host execution mode creates original and target protected mode environments* to operate guest software *in a virtual machine (VM)*...wherein responsive to a command to switch between *the protected modes*...the VMM causes the processor to *atomically switch between the original protected mode environment and the target protected mode environment*...and...*a virtual machine control structure (VMCS) to store state information for use in switching between the original protected mode environment and the target protected mode environment*...

Applicant respectfully requests that the Examiner review paragraphs [0036] through paragraph [0039] reproduced below to interpret Applicant’s claim limitations:

[0036] The processor and/or chipset 201 further *implements a virtual machine monitor (VMM) 204 to aid in implementing the host execution mode*. In one embodiment, the host execution mode enables a plurality of *separate protected mode environments to be created*. These protected mode environments may run guest software. In one embodiment, these protected mode environments *may operate as virtual machines*. Additionally, memory management functionality 203 is utilized to allocate memory to implement the protected mode environments, for example, as virtual machines.

[0037] For example, as shown in Figure 2, *an original protected mode environment 210 may be created by the processor 201 operating in a host execution environment* to implement guest software (e.g. an operating system 220, applications 221, drivers 222, etc.). In one embodiment, the original protected mode environment 210 may operate *as a virtual machine*.

[0038] In one embodiment, *the protected virtual machine monitor 204 enables an atomic switch between the original protected mode environment 210 and a target protected mode environment 215*. The target protected mode environment 215 may operate software (e.g. an operating system 230, applications 232, drivers 234, etc.). In one embodiment, the target protected mode environment 215 *may operate as a virtual machine*.

[0039] As will be described in more detail below, in one embodiment, in response to a command from software operating in the original protected mode environment 210, the virtual machine monitor 204 will cause the processor 201 to enter a virtual machine extension (VMX) mode. The virtual machine monitor 204 further stores the original protected mode state and the target protected mode state, exits out of the original protected mode state, enters the target protected mode state, exits out of the virtual machine extension mode, and then resumes operation in the target protected mode environment under the control of a new software application. (Emphasis Added).

As set forth in Applicant's claim and as described in Applicant's patent application, the processor implements a virtual machine monitor (VMM) to aid in implementing the host execution mode. The host execution mode enables a plurality of separate protected mode environments to be created, such as, the original and target protected mode environments. The original and target protected mode environments may operate as virtual machines (VMs). For example, *an original protected mode environment and a target protected mode environment may be created by the processor operating in the host execution environment and these protected mode environments may operate as virtual machines*. Moreover, in response to a command to switch between the protected mode environments, the VMM causes the processor to atomically switch between the original protected mode environment and the target protected mode environment.

In contrast, Bugnion relates to a very different invention. As set forth at column 4, lines 52-61, Bugnion states that:

In the preferred embodiment of the invention, a driver is downloaded into and is resident in the host operating system. A host operating system (HOS) context is then saved in the driver. A corresponding virtual machine monitor (VMM) context is saved in the virtual machine monitor. Switching from the HOS context to the VMM context is then carried out in the driver, whereas switching from the VMM context to the HOS context is done in the virtual machine monitor. The driver issues, in the HOS context, commands previously specified by the VMM. (Bugnion, column 4, lines 52-61, emphasis added).

As set forth above, this section of Bugnion relates to a driver that is downloaded and is resident in the host operating system and a corresponding VMM context that is saved in the virtual machine monitor. Further, switching operations in Bugnion relate to switching from the HOS context to the VMM context in a driver and switching from the VMM context to the HOS context in the VMM.

Thus, Bugnion relates to switching operations that occur between a host operating system (HOS) and a virtual machine monitor (VMM).

More particularly, Bugnion relates to: “A driver that is downloadable into the HOS at system level forms a total context switch between the VMM and the HOS contexts...A user-level emulator accepts commands from the VMM via the system-level driver and processes these commands as remote procedural calls...The emulator is able to issue host operating system calls and thereby access the physical system devices via the host operating system...The host operating system itself thus handles execution of certain VMM instructions, such as accessing physical devices.” (Bugnion, Abstract, emphasis added).

Switching operations that are performed in Bugnion occur between the HOS 340 and the VMM 360. (Bugnion, column 11, lines 29-33). Bugnion describes switching operations that occur between the HOS 340 and the VMM 360 and does not teach or suggest a VMM that causes a processor to atomically switch between an originally protected mode environment and a targeted protected mode environment.

Thus, it is clear that Bugnion is merely related to a host operating system (HOS) that handles execution of certain VMM instructions.

Applicant respectfully submits that it is clear that Bugnion does not teach or suggest Applicant’s amended independent claims generally related to: a processor having a normal execution mode and a host execution mode...a virtual machine monitor (VMM) *implemented in the host execution mode creates original and target protected mode environments* to operate guest software *in a virtual machine (VM)*...wherein responsive to a command to switch between *the protected modes*...the VMM causes the processor to *atomically switch between the original*

protected mode environment and the target protected mode environment...and...a virtual machine control structure (VMCS) to store state information for use in switching between the original protected mode environment and the target protected mode environment...

Because Bugnion does not describe or suggest the elements of Applicant's amended independent claims 1, 10, 19 and 28, Applicant respectfully submits that these amended independent claims, and the claims that depend therefrom, are not anticipated or rendered obvious by Bugnion.

Applicant respectfully requests that the Examiner allow these claims and pass them to issuance.

Conclusion

In view of the remarks made above, it is respectfully submitted that pending claims 1, 2, 4-11, 13-20, 22-29, and 31-36 are allowable over the prior art of record. Thus, Applicant respectfully submits that all the pending claims are in condition for allowance, and such action is earnestly solicited at the earliest possible date. The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application. To the extent necessary, a petition for an extension of time under 37 C.F.R. is hereby made. Please charge any shortage in fees in connection with the filing of this paper, including extension of time fees, to Deposit Account 02-2666 and please credit any excess fees to such account.

Respectfully submitted,

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